

**Revenue management in rural
electrification: The administrative and
operational costs of community-based
organisations**

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Executive summary

Overview

Evaluation of the status quo of Eskom's revenue management system reveals significant losses through inefficient and inappropriate practises. Eskom is incurring substantial losses through theft, fraud and debt; as well as from the high ad hoc costs associated with training and re-training vending agents, technical losses and maintenance costs associated with inadequate training of vending agents and legal costs associated with attempts to recover stolen or borrowed money. Experiences in some SACS offices show that through a combination of ongoing support and supervision, rewards and controls, the losses and ad hoc costs in the revenue management system can be substantially reduced and even eliminated. This paper aims to cost the current operation and administration functions of the revenue management component of the rural electrification process, as well as operational losses associated with these functions. The paper draws out lessons from current practises, specifically focusing on the support and training functions required to ensure efficient and cost effective community participation in the revenue management process.

Background

This costing exercise builds on two papers by James (1998) entitled Community participation in rural electrification: Building human capacity through the delivery of electricity to rural areas and Community participation in rural electrification: Community based organisations for operation, maintenance and administration in rural electrification. In her papers, James provides anecdotal evidence of inefficiencies in the vending and community liaison processes of rural electrification, pointing to substantial losses for Eskom. This paper focuses on the participation of community-based organisations and individuals in vending and attempts to cost the current operation and administration functions associated with revenue management in the rural electrification process to illuminate the costs of system inefficiencies and provide recommendations on how to reduce losses.

Objectives

The primary objectives of this research paper are to:

- Assess the current costs and losses associated with revenue management of rural electrification in South Africa.
- Identify the administrative and operational inefficiencies in the revenue management system and determine the costs and benefits to Eskom of improving these functional areas.

Approach

Interviews were conducted with the revenue managers in the Lydenburg and Pietersburg SACS offices in April 1998. These two offices were selected because they have substantial experience in managing the sale of electricity to remote rural areas. At the time of the interviews, the Pietersburg office had been experiencing difficulties with high incidences of theft and debt amongst vendors in their administrative region, while the Lydenburg office had to a large degree eliminated theft and debt amongst vendors in their administrative region. The different experiences of the two SACS offices, therefore, presented an interesting comparative case study.

The costs of revenue management of rural electrification is presented in two ways: firstly, in terms of the actual monthly costs incurred by Eskom per vending agent; secondly, in terms of specific activities (for example, training and retraining of vending agents or validator maintenance) to determine areas of inefficiency and system loss.

To derive the actual monthly costs, the revenue managers in the Lydenburg and Pietersburg offices were asked to provide the monthly fixed and operational costs for the different revenue management functions, namely:

- vending (that is, vending agents and stations);

- vending support and control (that is, functions performed by vending agent controllers);
- banking and revenue collection;
- reconciliation; and
- management.

In addition, they were asked to discuss particular problem areas and the associated costs. Revenue managers were also prompted to provide information on the type and cost of training, education and support provided to Eskom staff. Finally, revenue managers were asked to provide information on the losses incurred by Eskom from theft and debt.

To derive the costs of specific activities, the revenue managers were asked to provide information on the time spent performing these activities, associated travel and accommodation costs and other relevant items. Activities included:

- initial and formal ongoing training of vending agents;
- ad hoc retraining of vending agents;
- validator maintenance;
- vending agent support; and
- training of Eskom staff.

Results

Evaluation of the status quo reveals significant differences in the way in which revenue collection, reconciliation and education and training takes place in the regional SACS offices. The Lydenburg administrative office has developed a comprehensive programme of education and training and ongoing support, which together with a system of rewards and controls, aims to develop a closer relationship between Eskom and vending agents and reduce the risks of theft and debt. While these practises do add additional costs per vending agent, they also reduce losses from theft and debt, as well as ad hoc costs associated with vending agent retraining and technological losses. The table below summarises the costs of revenue management in the Lydenburg and Pietersburg administrative areas.

	Lydenburg		Pietersburg	
Customers	53 000		120 000	
No. of vendors	47		87	
	Total/month	Cost/agent	Total/month	Cost/agent
Vending agents				
Remuneration	66 352	1 412	91 350	1 050
Printing & stationary	8 907	190	26 970	310
Tokens	2 400	51	4 800	55
Validator maintenance	26 426	562	48 916	562
Education/training	142	3	-	-
Support costs				
Remuneration	8 483	180	12 725	146
Vehicle operation	4 300	91	7 095	82
Cell phone	-	-	672	8
Education/training	280	6	420	5

	Lydenburg		Pietersburg	
Controls				
Protection services	82 485	1 755	139 983	1 609
Reconciliation				
Remuneration	8 483	180	12 725	146
Temporary staff			1 250	14
Management				
Remuneration	11 722	249	11 722	135
Losses				
Theft and debt	0	0	9 762	112
Legal costs	0	0	450	5
TOTAL	219 838	4 676	368 840	4 239

The most significant differences in cost items between the two areas are:

- **Remuneration of vending agents:** In the Lydenburg administrative area, most agents receive a basic salary of R300 per month plus 2.5% on banked sales. In addition, agents are eligible for a monthly incentive bonus of R300 per month. In the Pietersburg administrative area, vending agents receive a monthly salary of R400 plus 2.5% on banked sales. While experiences with incentive bonuses in the Pietersburg administrative area have not been successful, in the Lydenburg area experiences have been positive. Incentives are used as both a reward and a punitive measure. If agents bank short, the shortages are recovered that month through the sales commission and the incentive bonus is taken away. Also, if reports of poor customer service are received, part of the incentive bonus is removed. Considering the salaries and commission that the agents receive, it is not worthwhile for them to rollover money and run the risk of losing their incentive bonus.
- **Printing:** The turnover of ink cartridges is substantially higher in the Pietersburg administrative area, particularly in the summer months when ink cartridges are replaced twice a month (as opposed to once a month in other areas). While this can, in part, be attributed to the heat, in part it can be attributed to inadequate training of the agents.
- **Education and training:** The cost of education and training is largely incorporated in the Eskom staff cost items, particularly that of the vending agent controllers who are employed to provide support and training. The type and form of training provided is, however, very different. In the Pietersburg administrative area, vending agents are provided with three days of formal training by the vending agent controllers and ad hoc retraining as required. Approximately 35% of vending stations are targeted for retraining. In the Lydenburg administrative area, vending agents are partnered with the nearest functioning agent for a week of pre-electrification on-the-job training, followed by one day of pre-electrification formal training provided by the vending agent controller. Formal workshops are held every six months to provide refresher training, introduce new concepts and discuss problems. On-going and ad hoc support and training are also provided, but with the system of formal biannual workshops, there is little need for ad hoc retraining once agents have settled into their jobs.
- **Validator maintenance:** Responsibility for the maintenance of validators is split between vending agents, the vending agent controllers and the validator suppliers/manufacturers. Eskom pays a fixed monthly maintenance fee of R562.25 to the suppliers of the validators. Vending agent controllers take responsibility for fixing minor validator problems. The extent to which costs are incurred for this function is dependent on the training provided to vending agents. For example, in the Northern Province, agent controllers make approximately four trips per month in response to minor validator problems which vending agents should be trained to fix. The average trip length is 75 kilometers and agent controllers

spend approximately two hours travelling and one hour with the vending agent. Assuming an internal charge rate of R20.00 per hour for agent controllers and an internal vehicle operating and maintenance cost of R0.43 per kilometer, the total cost per month for maintenance trips is R500.00. By providing vending agents with adequate training, these costs could be avoided.

- **Revenue collection:** In the Pietersburg region, collection and banking of revenue is undertaken by Eskom's Protection Services on a twice-weekly basis. In the Lydenburg administrative area, revenue collection and banking is undertaken by Fidelity Guards on a daily basis (on weekdays only, except for the larger vending agents who also have their revenue collected on Saturdays at the month-end). Frequent collection and banking of revenue reduces the amount of money accumulated by the vending agents and, therefore, decreases the risk of agents rolling over money and getting into debt.
- **Reconciliation:** There is a small difference in cost of reconciliation between the two areas. In the Lydenburg office, senior clerks are currently responsible for 24 reconciliations each and in the Pietersburg office, senior clerks are responsible for 29 reconciliations each. Experience has shown that the standard for efficient and cost-effective reconciliation should be no more than 15 reconciliations per senior clerk. The large number of reconciliations handled has led to both errors in the reconciliation process and substantial delays in payment of commission and salaries to vending agents. This, in turn, increases the risk of agents rolling over money and getting into debt. Delays in reconciliation also has implications for the ability of Eskom to recover these losses.

Industry perspective

Experience in the Pietersburg and Lydenburg offices reveals several areas for improvement in the revenue management system. Through a combination of ongoing support and supervision and rewards and controls, the losses and ad hoc costs in the revenue management system can be substantially reduced and even eliminated. Actions which should be undertaken to improve the revenue management system include:

- **Provide staff with appropriate training:** While the primary function of vending agent controllers is to provide support, supervision, and education and training to vending agents, they receive no training on how to conduct these training and support functions. To perform their training and support functions adequately, agent controllers should be provided with skills on understanding the context in which the organisation/individual is located and providing training and support within this framework.
- **Reduce the lag time:** Having a short lag period between sales, revenue collection, banking and reconciliation not only enables Eskom to identify and follow-up short banking promptly, thereby reducing the risk of losses from theft and debt, but also enables Eskom to make timely payments to vendors, thereby reducing the risk of vending agents rolling over money and getting into debt. The systems required to enable Eskom administrative staff to act quickly when theft or debt arises include daily collection and banking of revenue from vending agents, sufficient and well-trained senior clerks who are able to perform their reconciliation functions efficiently and accurately, and immediate action to follow up suspected short banking.
The additional costs associated with daily collection and banking of revenue is small – only R146.00 per vending agent per month – but it has substantial cost benefits in terms of reducing losses from theft and debt, legal costs of recovering money, and the cost of appointing and training new vending agents.
- Experience in the SACS offices shows that for prompt and accurate reconciliation, each senior clerk should be responsible for no more than 15 reconciliations. Assuming this standard, the cost of reconciliation is R278.00 per vending agent per month.
- **Provide adequate support and training to vending agents:** The experiences in the Lydenburg and Pietersburg administrative areas demonstrate the value of comprehensive initial and formal ongoing training for vending agents. Where vending agents are provided with limited initial training and no formal ongoing support, the ad hoc costs of retraining are

high. In comparison, where vending agents are provided with regular formal support and feedback, the overall costs are lower. For example, comparing the costs associated with provision of training in Pietersburg and Lydenburg shows that the difference in costs incurred by Eskom for education and training of vending agents is small, amounting to between R93.00 and R173.00 per vending agent, while the avoided ad hoc training costs are between R223.00 and R235 per vending agent. Investment in initial and ongoing training thus has a net financial benefit for Eskom. The transference of adequate skills through the provision of comprehensive up-front training and regular formal workshops not only reduces technological losses and the turnover of vending agents, but also establishes a closer relationship between Eskom and the vending agents, thereby reducing the risk of theft and debt by agents.

- **Provide adequate remuneration:** The remuneration package offered to vending agents must be sufficiently adequate to encourage commitment to vending as a business enterprise. The level of remuneration should take into account the responsibilities of the vending agent and the skills required and should value this service appropriately, as well as what income is required to adequately support the vendor. Loyalty of vending agents to Eskom can only be expected if the vending function is sufficiently valued and rewarded.

Keywords

Rural electrification, Revenue management, Community-based organisations

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1. Introduction

This paper builds on two papers by James (1998) entitled 'Community participation in rural electrification: Building human capacity through the delivery of electricity to rural areas', and 'Community participation in rural electrification: Community based organisations for operation, maintenance and administration in rural electrification', which assess the current rural electrification process and define the potential roles and functions of community-based organisations in the administration, operation and maintenance of rural electrification.

The paper aims to cost the current operation and administration functions of the revenue management component of the rural electrification process, as well as the operational losses associated with these functions. The paper draws out lessons from the current practices, specifically focusing on the support and training functions required to ensure efficient and cost-effective community participation in the revenue management process.

2. Revenue management: the status quo

This section details Eskom's current practises associated with the operation and administration of revenue management of rural electrification. The information presented is informed by discussions with Eskom personnel in the Pietersburg and Lydenburg administrative regions and is based on the practices and experiences in those two regions. While Eskom is attempting to standardise the rural electrification process, discussions revealed significant differences in the way in which revenue collection, reconciliation, and education and training takes place. It can be expected that other regions will reveal further similarities and differences, as well as innovative practises which aim to reduce the risks associated with managing the rural electrification process.

Taking into account these regional differences, this section aims to quantify the main operational and administrative cost items of revenue management, as well as to determine the extent of losses incurred by Eskom as a result of inadequate support and training and insufficient controls.

Revenue management can be divided into three functional areas: vending, revenue collection and banking, and reconciliation.

Vending agents are selected from the local area to fulfil the functions related to the sale of electricity on a contractual basis. Vending or field agent controllers oversee the vending agents, providing them with training and support and ensuring that they fulfil their contractual obligations adequately.

Revenue collection and banking is contracted out to revenue collection agencies. While Eskom has internal capacity in the form of Protection Services to perform the revenue collection and banking functions required, regional offices are not obliged to use their services and thus they are in competition with other independent revenue collection agencies, such as Fidelity Guards.

First-line reconciliation is undertaken by the revenue collection agencies (Eskom's Protection Services or Fidelity Guards contracted to the regional offices) and the vending agent controllers. A more comprehensive reconciliation is undertaken by senior clerks based at the regional administration offices. Sales are sent from the validator to the system master station to the mainframe and the final reconciliation takes place at a centralised level, where sales reports are balanced with the general ledger.

Responsibility for the management and supervision of the vending, revenue collection and reconciliation functions ultimately rests with the appointed senior officer located at the regional administrative centre.

2.1 Vending agents¹

Vending agents are Eskom's first line of communication with customers. Despite the importance of this interface position, the customer service component of their job receives far less emphasis than their role as revenue collectors, and training provided to vending agents focuses primarily on the technical and administrative aspects of their job. The primary functions for which vending agents are contracted are to:

- sell electricity cards or tokens for cash.
- receive new connection fees and issue receipts.
- receive penalty fees for meter tampering and issue receipts.
- receive and record customer complaints in a fault book.
- keep records of transactions, reconcile sales and provide documentary support for them.
- provide a good customer care service.
- hand out incandescent light bulbs and other promotional items to customers on an ad hoc basis.

2.1.1 Establishing vending agents

Vending agent controllers attend the pre-electrification mass meeting where they introduce the concept of the vending station and vending agent to the community. The vending agent controllers then work through the local electrification committee and the regional development council to identify candidates within the community to fulfil the vending agent functions. Once the electrification committee or regional development council has provided a list of candidates, the candidates are interviewed and criteria for selection are applied. The criteria for selection are set by the regional administrative offices and vary from area to area. For example, in the Pietersburg administrative area, candidates with established businesses are preferred and vending agents must pass a credit check. In contrast, the Lydenburg administrative office, rather than employing established business people, prefers to use the vending concept as a means of developing new entrepreneurial skills in the community. The minimum requirements for candidates in the Lydenburg administrative area are a Grade 12 level of education and a proficiency in English. Where vending agents are not established businesses, the regional development council is required to provide Eskom with a list of businesses from which the vending agents can operate.

Once the agent has been selected, the vending station is set up. Each agent is provided with a validator, printer and drop safe at a cost of R40 500 (R35 000 for the validator and R5 500 for the drop safe). This may take place pre- or post-electrification. In cases where it takes place pre-electrification, vending agents are responsible for receiving connection fees.

Before they are allowed to operate as vendors, Eskom provides the agents with training. The type and duration of training is determined by the regional administrative offices and varies substantially from region to region. The form and content of this training will be discussed in more detail in Section 2.1.2.3.

2.1.2 Operation of vending agents

The operating costs for the vending agents include:

- remuneration;
- printing and stationery costs;
- ongoing formal education and training costs;
- functional support costs;
- ad hoc costs.

¹ See James (1998b) for further debate on the roles and functions and operation of vending agents.

2.1.2.1 Remuneration

At a minimum, vending agents are paid a basic salary plus commission of 2.5% of their banked electricity sales. The remuneration package varies within and between administrative regions. In the Lydenburg administrative region, agents are eligible for different remuneration packages depending on when they entered into a contract with Eskom and what functions they perform. Those agents who entered into a contractual arrangement with Eskom prior to March 1998, receive a basic salary of R300 per month plus 2.5% commission on banked sales. In addition, these agents are eligible for a monthly bonus of R300 if there are no shortages and no service complaints by customers. Those agents who entered into a contractual arrangement with Eskom post March 1998, receive a monthly basic of R250 (agents would be eligible for R400 per month basic if they were responsible for banking of sales revenue, however, Fidelity Guards perform this function in the Lydenburg administrative region) plus 2.5% commission on banked sales (Davel 1998). In addition to a reduced basic monthly fee, new agents are not offered incentive bonuses. In the Pietersburg administrative region, agents are paid a monthly salary of R400 plus 2.5% commission on banked sales. While bonuses of R150 per month used to be offered as incentives, this system was abandoned by the Pietersburg administrative office as it was seen to have little impact on reducing revenue losses and 'those agents who were good remained good after the incentives were dropped' (van Rensburg 1998). In addition, vending agents pay between 4% and 25% of their income in tax.

Clearly the monthly remuneration received by the vending agents is highly dependent on their customer base. There is a trade-off between providing accessible vending stations to a dispersed rural population and creating sufficient threshold to ensure viability for the vending businesses. Eskom tries to centralise agents at a distance of between 5 and 8 kilometers apart (depending on the region), to maximise access for customers who, for the most part, are reliant on foot for transport. To ensure a viable threshold for the agents, vending stations may be placed up to 11 kilometers apart in more remote areas. Those agents situated in more densely populated areas can make a reasonable living off the commission from sales. For example, in the Northern Province, agents can earn up to R2 000 per month in commission (van Rensburg 1998). The average number of customers per agent is, however, 1 300 people (van Rensburg 1998). Assuming that the average customer spends R20.00 per month on electricity, the average commission will be approximately R650 per month. In the more remote areas of Mpumalanga, however, agents may have a customer base of no more than 350 people (Davel 1998). Again assuming that each customer spends approximately R20.00 on electricity per month, the agent will receive only R175 monthly commission.

In the Lydenburg administrative area, where agents are predominantly set up in business premises not owned by themselves, agents are required to pay a monthly rental fee of approximately R150 per month to the owner of the business in which they are based. If agents are only paid R250 basic per month and are required to pay approximately R150 in rental, they are earning only R100 per month before commission. In more remote areas, where the customer base is small, the remuneration package is inadequate for the level of skills and responsibilities required and the work undertaken. Eskom cannot expect loyalty and trust of agents if it does not provide adequate remuneration. This is discussed in more detail in Section 3.2.

2.1.2.2 Printing and stationery

The main cost components with regard to printing and stationery requirements are those of ink cartridges for the printers and books for documentation of transactions and fault reporting. Experiences in the Lydenburg and Pietersburg areas vary with regard to the turnover of ink cartridges. In the Pietersburg administrative area, the turnover of ink cartridges is very high, particularly in the summer months when cartridges need to be replaced approximately twice a month (as opposed to once a month in other areas). While this can, in part, be attributed to the heat, in part it can be attributed to inadequate training of the agents. Agents have subsequently been encouraged to store the cartridges in their refrigerators overnight to increase their lifespan. Ink cartridges are a relatively expensive cost item, costing between R96.00 and R145.00 per cartridge. Eskom has a contract with Nashua to purchase their ink cartridges at the higher cost,

but cartridges are purchased at a lower retail price from other suppliers when they are required at short notice. Currently, with cartridges being replaced twice a month in summer and once a month in winter, the cost per agent in the summer months (R192 to R290) is double that of in the winter months (R96 to R145). Considering the turnover of cartridges, substantial cost savings could be achieved if Eskom were to purchase cartridges from the lowest bidder. For example, in the Pietersburg administrative area, a saving of R8 526 and R4 263 could be achieved in the summer and winter months respectively.

Eskom provides vending agents with banking and daily sales books, as well as customer complaint and visitors books. Agents use approximately one bank book and daily sales book every two months. At a cost of R3 484 per 100 books, Eskom spends approximately R35.00 per agent per month for the documentation of transactions. In addition, each vending agent is provided with customer complaint and visitors books. In the Lydenburg administrative office, the cost of these books is approximately R34.00 per agent per month.

Another ongoing cost item is that of electricity tokens. The monthly cost of tokens is dependent largely on the number of customers in the region. Tokens cost approximately 4 cents each, amounting to approximately R2 400 per month for all electricity sold in the Lydenburg region and approximately R4 800 per month in the Pietersburg administrative region.

2.1.2.3 Education and training

The level of training and on-going support provided to vending agents varies between regions. In the Pietersburg administrative region, vending agents are provided with three days formal training by the vending controllers once the validator has been put in place. Formal training includes information on:

- issuing of tokens/e-cards;
- issuing of receipts for conventional meters;
- training to use banking deposit books (pre-paid and conventional billing);
- issuing of receipts for new connections;
- how to make key change tokens; and
- cancellation of tokens and reissue of token if not accepted by validator.

Vending agent controllers return to the vending agents approximately one to two weeks after the initial training to ensure that they are familiar with the technical and administrative aspects of vending and to provide additional training if necessary.

Retraining of vending agents is conducted on an ad hoc basis by the vending agent controllers. Vending agent controllers assess the need for retraining by perusing the sales reports, responding to complaints from customers coming through customer service and maintenance officials and following up on these complaints. Approximately 35% of all vending stations are targeted for retraining – this is, in part, due to a high turnover of vending agent staff and the consequent need to train new staff for those positions and, in part, due to the inadequacy of training at the start.

In the Lydenburg administrative area, agents are provided with far more comprehensive training than in Pietersburg. Training consists of:

- *Pre-electrification on-the-job training:* New agents are partnered with the nearest functioning agent for a week, where they are familiarised with the operation of a validator and the procedures associated with retail, reconciliation and banking of monies.
- *Pre-electrification formal training:* Once the validator has been installed, agents are provided with a days training by the station master controller (or senior vending controller) to ensure that they have been correctly taught during their weeks on-the-job-training. Training covers the technical aspects of operation of the validator and filling in support documentation, as well as administrative procedures. The vending agent is then ready to collect connection fees during the pre-electrification phase.

- *Ongoing and ad-hoc support and training:* Vending controllers visit agents once a week and if problems are identified, the controllers provide additional training. In addition, the vending controllers, senior clerks and fidelity guards monitor the documentation and customer complaints for problems. If any problems are experienced, agents are provided with further training. With new vending agents, controllers visit more frequently, until it is deemed that they have sufficiently grasped the complexities of their job. Davel (1998) states that with the system of formal biannual workshops, there is little need for ad hoc retraining once agents have settled into their jobs.
- *Formal workshops:* Workshops are held every six months with the aim of sharing business information with regard to losses; providing a forum for discussion with regard to procedural changes (for example, new contracts for new employees), providing information on metering, electricity safety and customer service (through presentations and videos); providing refresher courses on the procedures for reconciliation and associated reporting documentation (focusing on how the reconciliation process and reporting documentation relates to the way in which Eskom calculates commission); sharing information on the problems Eskom has experienced in conducting reconciliation and calculating commission; and providing an opportunity for vending agents to ask questions. The workshops are conducted by Eskom internal staff who are considered to have specialist knowledge in particular areas (for example, Customer Interface Training or reconciliation).

No formal training programmes have yet been set up by Eskom with regard to training vending agents and, therefore, it remains the initiative of the different offices to determine the type and level of training to be provided to the vending agents. However, in the Southern Region, a Vendor Customer Service training project was launched in May 1997. The training course aims to improve daily/weekly banking and customer service by vending agents and provides vendors with basic knowledge of generation, transmission and distribution in Eskom, environmental awareness, electricity dispensers and readyboards, dealing with upset customers, economical use of electricity, electrical safety in the home and tariffs (Eskom 1998). Training was designed to be facilitated on a one-to-one basis or to small groups of no more than five vendors.

2.1.2.4 Validator maintenance

Responsibility for the maintenance of validators is split between the vending agents, the vending agent controllers and the validator suppliers/manufacturers. Eskom has signed a maintenance contract with the suppliers of the validators for major technical faults (for example, if the validator breaks down). Eskom pay a fixed monthly fee of R865.00 for 65% of the validators in use (it is assumed that not more than 65% of the validators will experience technical faults).² If the fault is due to negligence on the part of Eskom or the vending agents, Eskom incur costs for fixing the validator and for travel costs (at a rate of R1.08 per kilometer) of the maintenance personnel over and above the maintenance fee. Suppliers charge for nuisance calls and, therefore, the vending agent controller always acts as the intermediary, checking on all reports of faulty validators to ensure that it is necessary to call the suppliers.

Vending agent controllers take responsibility for fixing minor validator problems. To reduce costs, agent controllers are required to bring faulty validators in to the administrative centre. In this way, Eskom minimises the travel reimbursements it has to make to the maintenance personnel of the suppliers, who charge R1.08 per kilometer for vehicle operation and maintenance costs as compared to Eskom's rate of R0.43 per kilometer.

2.1.2.5 Functional support costs

James (1998) argues that *sustainability* is not synonymous with *self-sustaining*:

[B]uilding sustainable community based organisations does not mean that they are self-sustaining. While devolving certain operational and administrative functions to community based organisations offers the potential to save costs, it does not mean that

² This amounts to a fixed maintenance fee of R562.25 per validator.

utility staff can adopt a hands off approach. Constant contact, support, assistance and training of members of community based organisations is essential.

Eskom recognises the significance of providing vending agents with support as a means of both maintaining control and reducing risks. Vending agent controllers were established to provide this support function and create an Eskom presence through regular contact with vending agents. The direct costs of the support function provided by vending agent controllers are discussed in Section 2.2 below.

2.2 Vending agent controllers

In their support role, vending agent controllers perform the following functions:

- initial training of vending agents;
- ongoing and ad-hoc support for vending agents which mainly entails responding to problems, rather than prevention of problems;
- regular visits (once-a-week) to vending agents to identify and rectify problems, create a presence and provide support;
- first-line reconciliation when visiting agents;
- retraining of vending agents where necessary; and
- trouble-shooting minor validator problems and collecting validators for more major maintenance issues.

2.2.1 Operation of vending agent controllers

2.2.1.1 Remuneration packages

As Eskom full-time employees, vending agent controllers receive a basic salary plus benefits. Agent controllers fall into the B-upper category with the commensurate salary band. On average, vending agent controllers receive a gross monthly package of approximately R3 615 (including basic salary, medical aid and pension contributions). In addition, they are eligible for a housing subsidy and an annual performance bonus of between 2% and 9% of their annual basic. Employees are also eligible for up to 38 days of leave per annum (if they have been in Eskom's service for more than six years). A minimum of 14 days leave must be taken per annum, while the remainder can be cashed in. In the Pietersburg administrative area, an annual budget of R25 000 is set aside for pay in lieu of leave. All vending agent controllers cash in part of their leave annually.

2.2.1.2 Vehicle operation and maintenance

Each vending agent has access to a pooled vehicle (2x4). While vending agent controllers reside in the areas in which they work, they are responsible for supporting and supervising 20 to 30 vending agents each and are thus required to travel significant distances to the different vending agents. They are also required to report to the administrative offices on a daily basis. In the Pietersburg administrative area, each vending controller travels between 5 000 and 6 000 kilometers per month. The running costs (operation and maintenance) of the vehicles are 43 cents per kilometer, amounting to a total of between R2 150 and R2 580 per month per vending agent controller. In the Lydenburg administrative area, vending agent controllers are spending approximately R2 150 per month on travel. Travel amounts to approximately R81.55 and R91.50 per vending agent in Pietersburg and Lydenburg respectively.

2.2.1.3 Cell-phones

Considering the relative remoteness of some of the areas in which Eskom operates, cellular contact is vitally important. While Eskom does not provide vending agent controllers with cell-phones, in some cases, Eskom contributes to the monthly operating costs of the cell-phones owned by vending agent controllers. The Pietersburg administrative office contributes 60% toward monthly rental of the cell-phone (R114.00 per phone per month) and pays the costs for business-related phone-calls, averaging at R110 per month per vending agent controller.

2.2.1.4 Education and training

The budget for education and training of vending agent controllers is R2 900 per annum per person, but may be increased if there are additional appropriate courses that the agent controllers would like to attend. The types of training provided include training from AEG and Conlog with regard to the technical operation of meters, computer courses, training on reconciliation procedures, and Customer Interface Training (CIT).

The CIT programme modules are developed and updated at the national level, but implemented on a regional basis. At a regional level, staff are responsible for setting up the courses (booking venues, accommodation and so on), identifying regional trainers, and preparing course materials for the learners and organising course kits. In the Pietersburg region, two staff members are responsible for the co-ordination and logistics of implementing CIT, while the actual training is undertaken by regional consultants with expertise in, for example, inter-cultural knowledge or inter-personal skills. In some areas, however, Eskom line trainers are used for CIT.

Each class is made up of 8 to 15 people, with the aim of getting as broad a cut of expertise as possible so as to facilitate interaction between different interface groups and allow them to learn from each others experiences. CIT is divided into three clusters – customer service, product and inter-personal. The customer service cluster is a two day workshop which aims to facilitate introspection with regard to how interface staff view customers and customer service, as well as to provide information on how best to interact with customers in different contexts. The product cluster focuses on Eskom and the environment, electricity awareness (providing basic information on what electricity is, unit measurements, metering and safety), tariffs and pricing, and billing (how to read bills). The product cluster is taught over a period of four days. The interpersonal cluster (taught over three days) focuses on the diversity of customers, what motivates staff and customers and conflict management.

Costs of CIT can be broken down into:

- organisational costs;
- workshop venue;
- meals;
- preparation of learner kits and workshop materials; and
- costs of trainers (fee, travel and accommodation).

These direct costs are borne by the CIT Programme and recouped through the workshop fee of R300. Other costs include, those of travel to and from the workshop and accommodation for the learners. These costs are borne by the learners/workshop participants. Accommodation costs in the region of R230 per night in the region. In some cases, however, the workshops are held in the administrative centre and workshop participants do not incur travel or accommodation costs.

An audit has been done to evaluate the assessor process and to determine through customer feedback, whether there has been a change in customer approach amongst Eskom staff. No evaluation has been conducted of the course content, however. The primary functions of the vending agent controllers are to set up the vending agents through consultative processes and to train and support the vending agents. Vending agent controllers receive no training, however, on either these training and support functions or community participation.

2.3 Revenue collection and banking

In certain regions in the past, vending agent controllers were responsible for the collection and banking of revenue. During this period, Eskom experienced huge losses as a result of both theft and vending agents rolling over money and getting into debt. Eskom now employs revenue collection agencies to perform this function. This has to some extent ameliorated the risks, but theft and debt remain an issue. Arguments in favour of revenue collection agencies over vending agent controllers are that the revenue collection agencies provide a more controlled

and supervised, as well as a more regular means of collecting money and, therefore, the risk of theft and money rolling is reduced.

In the Pietersburg region, collection and banking of revenue is undertaken by Eskom's Protection Services. There are 8 to 10 teams of between two to four people working in the area. The protection services visit the vending agents twice a week to conduct draw downs and collect the revenue. In Lydenburg, collection and banking of revenue is undertaken by Fidelity Guards. There are three teams of two people each working in the area. Collection and banking of revenue occurs daily on weekdays. Revenue is also collected on Saturdays at the month-end for the two largest vending agents. The aim of this system of frequent revenue collection is to reduce the amount of money accumulated by the vending agents and, therefore, to decrease the risk of agents rolling over money and getting into debt.

2.3.1 Functions of protection services/Fidelity Guards

Fidelity Guards are responsible for the collection, conveyance and delivery of cash from vending agents on behalf of Eskom. Fidelity Guards are employed on a contractual basis and are required to:

- use locked and sealed containers, special vehicles, as well as armed and identified personnel;
- be in radio or cell phone contact;
- keep accurate records of all kilometers travelled as well as time each point was visited;
- witness agent perform end-of-shift and cash up;
- complete bank deposit slip for banking purposes;
- check and verify cash against total end-of-shift printout and bank deposits;
- download transactions;
- bring all deposit slips and necessary documentation to Eskom office morning after money has been banked;
- complete disc register for every disc exchange between office, agent and security;
- provide agent with written proof of money collected;
- collect duplicates of customer complaints from the agents complaint book;
- deliver post to and from all points;
- conduct first-line check if validator is out of order;
- key control of 'drop safes'; and
- report incidents within 12 hours (Taljaard 1998).

Eskom's protection services perform similar functions to the Fidelity Guards, taking responsibility for the first-line reconciliation, draw downs and collection of revenue, and the transport of revenue from agents to the bank. In addition, they are required to investigate robberies and shortages, open civil cases with police and confiscate validators where the agent is suspected of stealing.

2.3.2 Costs of revenue collection

For the two security services – Eskom Protection Services and Fidelity Guards – used, the functions performed are relatively similar. The level of service is significantly different, however, with the Fidelity Guards collecting revenue on a daily basis (weekdays only) and Eskom's Protection Services collecting revenue twice weekly. There is also a significant difference in the costs of the two services: the Fidelity Guards charge R1 755 per agent for a five day per week service, while Protection Services charge R1 609 per agent for a twice weekly service. If the service in the Lydenburg administrative area was reduced to twice weekly, the rate would be reduced to R1 122 per agent. There are, however, distinct advantages to continuing the higher level of service as it increases the financial accountability of the vending agents and reduces the

losses associated with theft and bad debt, as well as reducing the costs, such as lawyers fees and staff time, associated with recovering those losses. In addition, by ensuring the financial accountability of the vending agents, there is less staff turnover and, therefore, the costs associated with setting up and training new vending agents is reduced.

2.4 Reconciliation

Reconciliation occurs at several different levels. The first-line reconciliation takes place at the vending station and entails reconciliation of the banking batch list with daily reports. This reconciliation process aims to identify gross discrepancies, as well as act as a control through establishing a presence. In the Pietersburg administrative area, this is conducted by Protection Services twice-a-week during the process of revenue collection and by the vending agent controllers once-a-week during their visits. In Lydenburg, vending agent controllers take responsibility for conducting a first-line reconciliation every three days and the Fidelity Guards conduct a first-line reconciliation on weekdays when they collect the revenue.

Comprehensive reconciliations are undertaken by senior clerks based at the regional administrative offices. The process entails reconciling banked monies with sales reports. In Lydenburg, reconciliation is done on a daily basis and at month-end. While Eskom's recommended standard for reconciliation is that each clerk should be responsible for no more than 15 reconciliations per day, staff shortages in both the Pietersburg and Lydenburg offices mean that senior clerks are responsible for far greater numbers of reconciliations – 24 reconciliations per person in Lydenburg and 29 reconciliations per person in Pietersburg. This has serious implications for the effective functioning of revenue management. The large number of reconciliations handled has led to both errors in the reconciliation process (resulting in cases where vending agents have been underpaid or falsely accused of short banking) and substantial delays in payment of commission and salaries to vending agents. For most of the vending agents working in the areas controlled by the Pietersburg and Lydenburg offices, the salary and commission from electricity sales is their primary source of income. Errors and delays in payment of commission and salaries generates distrust between Eskom and the vending agents and increases the risk of agents rolling over money and getting into debt. The two offices have employed different methods to try and keep ahead of the reconciliation – at Pietersburg, temporary staff were employed to address the backlog and thus enable the permanent staff to start anew and keep up-to-date with the reconciliations. This proved to be a short-term solution – by January, temporary staff had managed to eliminate the backlog and by April the staff were once again a month behind in the reconciliation process. The Lydenburg office has managed for the most part to keep up-to-date with daily reconciliation until recently. Month-end reconciliations create additional strain on the staff, who are then unable to complete daily reconciliation. Up-to-date reconciliation is recognised as a vital element to reduce the risks of money rolling and, therefore, the Lydenburg office has been negotiating to redirect funds and shift people around so as to have additional reconciliation staff. Delays in reconciliation not only has implications for increasing the incidences of money rolling by vending agents, but also has implications for the ability for Eskom to recover these losses. Practice of the Lydenburg office has shown that risks can be reduced by shortening the time between sales, revenue collection, banking, reconciliation and follow-up. The Lydenburg office has, in the past, successfully, limited this to a three day lag period – collecting and banking revenue daily, reconciling the sales with the banking lists on the following day and following up any short banks on the third day.

It is difficult to separate out the reconciliation functions of the vending agent controllers and revenue collection services from their other functions and, therefore, the costs associated with these functions have been covered under the previous sections. Sections 2.4.1 and 2.4.2 below detail the costs of the senior clerks or cashiers.

2.4.1 Fixed costs

The most significant fixed costs are the cost of computers. Each senior clerk has a pentium computer valued at R5 000 per computer.

2.4.2 Operating costs of senior clerks

2.4.2.1 Remuneration

Senior clerks are graded as B Upper in terms of the salary band into which they fall and thus receive a salary package of approximately R3 615 per month. In addition, they are eligible for housing subsidies, an annual performance bonus of between 2% and 9% of their annual basic and up to 38 days leave per annum.

2.4.2.2 Education and training

No standardised technical training is provided for senior clerks. Regional offices are responsible for developing their own systems of capacity building. In the Lydenburg administrative office, two experienced Eskom staff were employed to provide the new senior clerks with two days training on the revenue management system and the reconciliation procedure. The training proved to be insufficient as errors in the reconciliation emerged and a further two days training was organised. To assess the success of the training, an internal audit was organised and problems that emerged were addressed. A recent external audit has revealed no further errors and it is assumed that the senior clerks are now capable within their jobs.

In the Pietersburg administrative office, high staff turnover has had implications for both the accuracy and efficiency of reconciliations and the costs of training. When the reconciliation process was initiated, four senior clerks were employed to conduct a total of 18 reconciliations. Over a period of time, the original four senior clerks all left their positions for promotions. At present, there are three senior clerks who are responsible for 87 reconciliations.

2.4.2.3 Ad hoc costs

As mentioned above, the Pietersburg administrative office was forced, as an interim measure, to employ temporary staff to address the backlog of reconciliations that had built up as a result of staff shortages. By April 1998, R15 000 had been spent on temporary staff (van Rensburg 1998) and this has not rectified the problem.

2.5 Management

Responsibility for the management of the revenue system is undertaken by senior officers based at the regional administrative offices. The senior officers are responsible for:

- setting up the revenue systems and ensuring their smooth operation;
- planning and budgeting;
- supervising vending agent controllers; and
- troubleshooting where necessary.

Senior officers fall into the C-Upper salary band, receiving an average salary of R7 910.00 per month (including pension and medical aid). In addition, they receive an annual performance bonus of between 2% and 9% of their annual basic salary and are eligible for a housing subsidy. Senior officers are also eligible for a maximum of 38 days leave. Other benefits include an allowance for vehicle purchase and a business scheme for vehicle operating cost (approximately, R1 700.00 and R1 400.00 per month respectively).

2.6 Losses

2.6.1 Through theft and debt

Certain regions have experienced substantial losses as a result of agents rolling over money and getting into debt or robbing their own vending stations. In the Pietersburg administrative area, three agents have been dismissed for robberies and several agents have got into debt. While in some cases, agents may be 'bad', in other cases – for example, where there have been errors in reconciliation and agents have been underpaid or falsely accused of short banking or where payments have been late and agents have been forced to 'borrow' money to survive – the responsibility for debts incurred must be shared by Eskom.

Over 28 months, the losses incurred at the Pietersburg administrative centre amounted to R306 000, most of which was directly related to agents rolling over money and getting into debt. Assuming an even spread of losses over the 28 months, annual losses from theft and debt amounted to approximately R131 000.³ Eskom employs legal services in an attempt to recover the debt. This has had limited impact as most agents have few assets and limited capital, and for the most part it merely adds to the net costs of rural electrification. In one case an agent rolled over R43 000. Legal proceedings was initiated, but only R6 400 of the debt was recovered. In 1997, the cost of legal services to recover debt amounted to approximately R10 000 and only R4 600 was recovered.

Insurance claims decrease the overall losses, but the total losses remain substantial. In 1997, the Pietersburg administrative office recovered approximately R10 000 through insurance claims and a further R4 000 has been approved by the insurance company.

While it is difficult to separate out the degree to which different measures have an impact on loss reduction, experiences in the Lydenburg administrative and other SACS offices point to some of the ways in which the sustainability and financial accountability of vending agents can be improved. Attention needs to be given to providing close support, strict financial control and training, as well as providing sufficient reward. Measures include:

- Adequate remuneration for vending agent controllers.
- Reduce the lag time between sales, revenue collection, banking, reconciliation and follow-up of short banks. Requirements to achieve this include daily collection of revenue from agents, sufficient staff to keep reconciliation accurate and up-to-date, and immediate action where wrongdoing is suspected.
- Provide ongoing support to agents in terms of keeping regular contact to identify problems, share experiences and find solutions.
- Provide adequate up-front training to both vending agents and agent controllers to reduce ad hoc costs associated with reactive troubleshooting and retraining, as well as to encourage a trusting relationship between Eskom and the vending agents.

The additional costs and potential savings which can be achieved through these measures are outlined in Section 3.

2.6.2 Technological losses and education

Inadequate education and training with regard to operation of unfamiliar technology may result in mishandling of the technology, thus increasing the losses experienced by Eskom. In the Pietersburg administrative area, five validator power packs have been destroyed by lightening as a direct result of inadequate education and training. Validators are supplied with conductors which effectively protect the power pack from destruction in the event of a lightening strike. Once lightening has struck the conductor, however, it is no longer effective. Vending agents have not been provided with simple information with regard to checking the conductor to ensure that it is still intact and disconnecting the validator in the event of the conductor being destroyed. If this information had been supplied to vending agents prior to them becoming operational, the destruction of these validator power packs could have been avoided.

³ The occurrence of losses from theft and debt has, in fact, decreased since Protection Services were introduced to collect revenue, but high losses still occur.

	Lydenburg		Pietersburg	
Sales ¹	R1 658 800		R1 620 000	
Customers	53 000		120 000	
No. of vendors	47		87	
	Total/month	Cost/agent	Total/month	Cost/agent
Vending agents				
Remuneration ²	66 352	1 412	91 350	1 050
Printing & stationary	8 907	190	26 970	310
Tokens	2 400	51	4 800	55
Validator maintenance	26 426	562	48 916	562
Education/training ³	142	3	-	-
Support costs ⁴				
Remuneration	8 483	180	12 725	146
Vehicle operation	4 300	91	7 095	82
Cell phone	-	-	672	8
Education/training	280	6	420	5
Controls				
Protection services	82 485	1 755	139 983	1 609
Reconciliation				
Remuneration	8 483	180	12 725	146
Temporary staff			1 250	14
Management				
Remuneration	11 722	249	11 722	135
Losses				
Theft and debt	0	0	9 762	112
Legal costs	0	0	450	5
TOTAL	219 838	4 676	368 840	4 239
% of sales	13%		23%	
Cost/customer	R4.15		R3.07	
Cost/kWh	R0.04		R0.08	

¹ Sales in Lydenburg are based on actual monthly sales. In Pietersburg, sales are calculated using the average monthly customer bill.

² Remuneration in Lydenburg is based on actual monthly costs. In Pietersburg, remuneration is based on a basic salary of R400 plus an average commission of R650 per agent per month.

³ Education and training refers to the direct costs incurred for the formal workshops. Staff costs are included under support costs.

⁴ Support costs refer to the cost of operating vending agent controllers who provide functional support and education and training for the vending agents.

Table 1: Cost of revenue management in the Pietersburg and Lydenburg administrative areas

While the cost per agent and per customer is lower in the Pietersburg than in the Lydenburg administrative area, this can be attributed partly to the economies of scale afforded by the larger customer base in the Pietersburg administrative area and partly to the fact that vending agents in the Lydenburg area are offered a remuneration package which affords them a more decent standard of living.⁴

⁴ This can be demonstrated by the fact that if the management component of the overall costs is removed (an item which is affected considerably by the economies of scale in the Pietersburg administrative region)

3. Improving the revenue management system

Section 2 detailed the actual administrative and operating costs incurred by Eskom in the implementation of the revenue management system associated with the rural electrification programme. In the discussion of the status quo, areas of inefficiency in the revenue management system were alluded to. This section draws on the experiences in the Lydenburg and Pietersburg administrative regions to make recommendations for improving the revenue management system. Where possible, inefficiencies in the revenue management system are highlighted by detailing the specific costs associated with these activities or the potential savings which can be achieved by conducting these activities differently.⁵

Section 2 showed that Eskom is incurring substantial losses through theft, fraud and debt (amounting to approximately R112 400 in the Pietersburg administrative office in 1997 including recovered monies and insurance pay outs). Other costs alluded to were the high ad hoc costs associated with the training and retraining of new and existing vending agents, technological losses and maintenance costs associated with inadequate training of vending agents and legal costs associated with attempts to recover stolen or borrowed revenue (R10 000 in 1997 in the Pietersburg administrative area).

Experiences in the Lydenburg administrative and other SACS offices have shown that through a combination of ongoing support and supervision, rewards and controls, the losses and ad hoc costs in the revenue management system can be substantially reduced and even eliminated. Actions which should be undertaken to improve the revenue management system are:

- providing staff with appropriate training,
- establishing an Eskom presence through regular contact and communication.
- developing close relationships with vending agents.
- reducing the lag-time between sales, revenue collection, banking, reconciliation and follow-up.
- acting immediately in the case of suspected wrong-doing.
- providing educational and training support on an ongoing basis.
- providing adequate remuneration and incentives to encourage vending agents to fulfil their functions effectively.

3.1 Providing staff with appropriate training

Eskom staff, including Electrowise advisors, have pointed to the inadequacies in the training which some of the Electrowise advisors and other community workers receive. Inasmuch as there is a need to support community based organisations, whether vending agents or customer service representatives, there is also a need to support, supervise and manage Eskom staff who are to undertake this work (James 1998b: 18).

The primary function of vending agent controllers is to provide support, supervision, and education and training to individuals or community-based organisations responsible for performing vending functions.

Vending agent controllers are responsible for setting up vending agents through consultative processes and providing training and support to vending agents. They receive no training, however, on how to conduct these training and support functions. Customer Interface Training provided to vending agent controllers focuses predominantly on the product and customer service. It is generally assumed that if vending agent controllers have knowledge of the product,

and the vending agent remuneration component is equalised at R1 050 per vending agent, the cost per vending agent will be lower in the Lydenburg than in the Pietersburg administrative region.

⁵ The costs detailed in this Section should not be added to those detailed in Section 2 as it will amount to double counting.

they will be able to provide adequate support to vending agents. It is clear, however, that without appropriate training on how to work with and support community-based organisations or individuals responsible for performing vending functions, agent controllers are unable to adequately fulfil their functions. Agent controllers require skills on understanding the context in which the organisation/individual is located and providing training and support within this framework.

3.2 Establish an Eskom presence

One way in which Eskom attempts to keep the vending agents financially accountable is through establishing a regular presence – this is done primarily through regular visits by vending agent controllers and security personnel, but also, in some cases, through hands on management. In the Lydenburg administrative office, the senior officer gets actively involved where agents are suspected of short banking adding authority to the issue. As a counter balance, the senior officer also sends letters of affirmation to vending agents who are performing well.

3.3 Reduce the lag-time

The Lydenburg administrative office has attempted to limit the lag-time between sales, revenue collection, banking and reconciliation. Until recently, they have successfully managed to maintain a three day lag period through daily collection of revenue and reconciliation. Having a short lag period enables the Lydenburg office to identify and follow-up short banking promptly, thus increasing the chances to recover any short falls. The systems required to allow the Eskom administrative staff to act quickly when theft or debt arises are:

- daily collection of revenue from vending agents to ensure that the reconciliation process is kept up-to-date,
- sufficient and well-trained senior clerks who are able to perform their functions efficiently and accurately, and
- immediate action to follow-up suspected short banking.

3.3.1 Collect and bank revenue daily

The daily collection and banking of revenue by revenue collection agencies reduces the opportunity for vending agents to steal or borrow revenue by minimising the amount of money held by them at any one time and creating a physical security presence,

The additional costs associated with the daily collection of money is small – only R146.00 per agent per month (or R1 752 per year) – but it has substantial cost benefits in terms of reducing losses from theft, fraud and debt; legal costs of recovering money; and cost of appointing and retraining new vending agents.

3.3.2 Prompt and accurate reconciliation of sales and revenue

To reduce risk and maintain control, Eskom needs to keep administration (reconciliation, documentation and payments to vending agents) up-to-date. The quicker it takes Eskom to identify and follow up debts, the more likely they are to recover the money. The more timely payments are to the vending agents, the less likely the vending agents are to roll over money and get into debt.

The established Eskom standard for accurate and timely reconciliation is a maximum of 15 reconciliations per senior clerk. Experience in the Lydenburg and Pietersburg administrative office corroborates this standard. With 87 and 47 vending stations in the Pietersburg and Lydenburg administrative areas respectively, three more senior clerks would be needed in the Pietersburg office and one more in the Lydenburg office for effective and efficient reconciliation on a daily basis. In addition, increased numbers of well trained senior clerks is likely to reduce errors in reconciliation, thereby encouraging trust between agents and Eskom and reducing losses from theft and debt.

The additional costs incurred by Eskom to set up and train each senior clerk are R5 000.00 for a computer and R1 280.00 for training (assuming an internal staff rate of R20.00 per hour). The per annum staff cost incurred by Eskom for each new senior clerk is approximately R50 000.00 per annum. Assuming the standard of 15 reconciliations per senior clerk, the cost per vending agent would be R278.00 per month.

While the costs of reconciliation are substantially increased when applying this standard, the efficient functioning of reconciliation will eliminate the costs of temporary staff employed to address the backlog in reconciliation (R15 000.00 in the Pietersburg administrative region) and, in part, reduce losses associated with debt and theft by vending agents, legal services required to recover losses and cost of appointing and training new vending agents.

3.3.3 Immediate follow-up

With the reduced lag time, Eskom is able to act immediately if any problems arise. For example, if an agent rolls over money, Eskom can prevent the agent from getting into debt which he/she cannot repay. While there is a need to act quickly, this must be balanced with caution. In the Lydenburg administrative area, one agent is suing Eskom for R100 000 for accusing him of theft. Suspected theft and debt must be closely investigated and discussed with the agent. Vending agents must be adequately warned and decisive action must be taken if problems continue to arise.

3.4 Provide adequate support and training

James (1998b) argues convincingly that Eskom must provide ongoing support and training to vending agents. In the Pietersburg administrative area, once vending agents have been provided with initial training, they are considered to be self-sufficient. Any further support and training provided to the vending agents occurs in a reactive and ad hoc manner. In comparison, in the Lydenburg administrative area, emphasis is placed on ongoing training and support. Vending agents are invited to formal workshops twice a year where they are provided with refresher training, introduced to new concepts and issues, and invited to share their concerns. The current costs of education and training vary between the two regions depending on the level and duration of training provided. Boxes 1 and 2 below detail the costs.

Initial training

Vending agent controllers travel to vending agents to provide training over a period of three days. If the destination is far from Pietersburg, agent controllers receive an out allowance of R150.00 per night for two nights. The charge rate for Eskom agent controller staff is R20.00 per hour (van Rensburg 1998). The cost of the agent controllers time for the period of three days (assuming an eight hour working day) is, therefore, R480.00. Assuming that the average distance of vending stations from Pietersburg is 75 kilometers and a cost of R0.43 per kilometer for vehicle operation and maintenance, the cost of travel is approximately R65.00. As the training focuses on technical or practical aspects of vending (use of validator and associated documentation), no preparation or material costs are incurred. The total cost to Eskom for the initial training is, therefore, R845.00 per vending agent.

Follow-up training

Follow-up on the initial training by the vending agent controllers takes between half-a-day to a day to complete. Assuming an hourly rate of R20.00, staff time costs are between R80.00 and R160.00. Assuming a vehicle operation and maintenance cost of R0.43 per kilometer and an average distance of 75 kilometers, the cost of travel is R65.00. Again, no materials or preparation costs are required. The total cost of the follow-up training is between R145.00 and R225.00.

Ad-hoc retraining costs

Approximately 35% of vending agents in the Pietersburg administrative area require retraining. Assuming that 57% of those are new agents replacing agents in established vending stations and 43% are existing agents requiring refresher training, the per annum cost of retraining of existing agents in the Pietersburg administrative area is between R1 885.00 and R2 925.00 (based on the cost of follow-on training). The per annum cost of training new staff for existing vending stations amounts to approximately R17 510.00. Averaged out, the ad hoc training costs are between R223.00 and R235.00 per vending station.

Box 1: Cost of formal education and training in Pietersburg administrative area

Pre-electrification on-the-job training

Vending agents do not receive an income during their first two weeks of training as it is considered by the Lydenburg administrative office to be a personal investment by the vending agents in their future income generating capability. The established vending agents who are required to provide the training also do not receive payment. It is our contention that the trainers of the new vending agents should be paid for their time and labour. Based on Eskom's internal rate for vending controllers (who perform the training function) of R20.00 per hour, the shadow wage for the trainers is approximately R800.00 per week. The cost of on-the-job training is, therefore, *R800.00*.

Pre-electrification formal training

Assuming the same staff and vehicle operation and maintenance rates as in the Pietersburg administrative area, the cost of a full-days training is *R225.00*.

Formal workshops

Vending agents are divided regionally into two groups and attend separate full-day workshops twice a year. Eskom does not pay the transport costs for the vending agents to attend the workshops, but does provide lunch at a cost of R425.00 per session (Davel 1998). Preparation for the workshop takes one day and seven Eskom staff members are present at the workshops. Based on Eskom's staff rate of R20.00 per hour, the time and labour costs of the workshop are R160.00 for preparation and R1 120.00 for the workshop. Material costs are negligible and are, therefore, not included. The total cost for one session, excluding preparation costs, is R1 545.00 and the total cost of the workshops for the year is *R6 500.00* including preparation costs. Averaged out, the cost of the formal workshops is R138.00 per vending agent.

Box 2: Cost of formal education and training in Lydenburg administrative area

The experiences in the Lydenburg administrative area clearly show that formalised ongoing training has a positive impact on the losses incurred by Eskom. Comparing the costs associated with the provision of training in the Pietersburg and Lydenburg administrative areas shows that the difference in costs incurred by Eskom for education and training of vending agents is small, amounting to between R93.00 and R173.00 per vending agent, while the avoided ad hoc training costs are between R223.00 and R235.00 per vending agent. Investment in initial and ongoing training thus has a net benefit for Eskom.

Inadequate training results in inefficiencies in the revenue management system. For example, in the Northern Province, agent controllers make approximately four trips per month in response to minor validator problems which vending agents should be trained to fix. The average trip length for these visits is 75 kilometers and agent controllers spend approximately two hours travelling and one hour with the vending agent. Assuming an internal charge rate of R20.00 per hour for agent controllers and an internal vehicle operating and maintenance cost of R0.43 per kilometer, the total cost per month for maintenance trips is R500.00. By providing vending agents with adequate training up-front, these costs could be avoided.

It is clear that the transference of adequate skills through the provision of comprehensive up-front training and regular formal workshops not only reduces technological losses and the turnover of vending agents, but also establishes a closer relationship between Eskom and the vending agents, thereby reducing the risk of theft and debt by agents.

3.5 Making it worth while?

The current structure of the vending agents' remuneration package creates a strong link between total monthly income and sales. As the basic salary shrinks (from R300.00 to R250.00 in the Lydenburg administrative area), the dependence of vending agents on commission from sales increases. In more remote areas, where the customer base (and hence sales) is small, vending agents may receive a net income of as little as R275.00 per month. In such cases, where the vending function is undervalued and insufficiently rewarded, Eskom cannot expect vending agents to be loyal to them if they are provided with insufficient incentive to fulfil their contractual obligations to Eskom.

The remuneration package offered to vending agents must be sufficiently adequate to encourage commitment to vending as a business enterprise. The level of remuneration should take into account the responsibilities of the vending agent and the skills required and should value this service appropriately, as well as what income is required to adequately support the

vendor. This can be established through a 'basket of goods' approach which identifies the needs of the vending agent.

There are several ways in which Eskom can address the structure of the remuneration package to provide an adequate income to all vending agents. Firstly, Eskom could standardise the basic salary at a level which, when combined with the minimum commission received in the region, remains acceptable. Secondly, Eskom could standardise the minimum remuneration package, with a minimum and maximum basic salary. Under this scenario, those agents in more remote areas would potentially receive a higher basic than those in areas with strong customer bases. Thirdly, Eskom could use incentive bonuses to encourage vending agents to perform their functions adequately. Experience with incentive bonuses in the Lydenburg administrative area has been very positive. Agents are paid an incentive bonus of R300 (equal to their basic salary of R300). Incentive bonuses are used as both a reward and a punitive measure. If agents banked short, the shortages would be recovered that month through the sales commission and the incentive bonus would be taken away. Also, if reports of poor customer service are received, part of the incentive bonus is removed. Considering the salaries and commission that the agents receive, it is not worthwhile for them to roll over money and run the risk of losing their incentive bonus. To be effective, the incentive bonus must be sufficiently rewarding.

4. Conclusions

While it is difficult to determine the exact impact that any one of above recommendations would have on the losses experienced by Eskom in the implementation of the revenue management system associated with its rural electrification programme, it is clear that through a system of rewards and controls, together with efficient operation of reconciliation, Eskom can substantially reduce the risk associated with vending, while building positive relationships with the community-based organisations contracted to perform this function.

Some of the recommendations made have a clear net financial benefit for Eskom. For example, Eskom can gain financially by providing adequate up-front training and regular formal retraining, together with informal contact and support and thereby avoiding the ad hoc costs associated with the current high turnover of vending agents, the ad hoc costs of retraining and the technological losses associated with inadequate up-front training. A further example is that through providing frequent collection and banking of revenue at a small additional cost, Eskom can substantially reduce the incidence of theft and debt, as well as the need for retraining of staff.

Other recommendations have a less direct benefit for Eskom. For example, by ensuring prompt and accurate reconciliation, Eskom can develop a trusting relationship with vending agents, thereby reducing the risk of theft and debt. Furthermore, by providing vending agents with adequate remuneration packages, Eskom can reduce the incidence of theft and debt and vending agent turnover.

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